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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,753	07/20/2006	Catherine Daines	4195-033/R8706US	2835

24112 7590 10/27/2010
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ART UNIT	PAPER NUMBER
1776	

MAIL DATE	DELIVERY MODE
10/27/2010	PAPER

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/577,753
Filing Date: July 20, 2006
Appellant(s): DAINES ET AL.

Larry L. Coats, Esq.
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 8-26-10 appealing from the Office action mailed 2-23-10.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

The rejected claims are 28, 29, 31, 38, 40, 41, 44-49, 55, 57, and 59-70.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the

subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

4,137,162	Mohri et al.	1-1979
5,407,644	Rytter et al.	4-1995
5,607,593	Cote et al.	3-1997
4,589,927	Allen et al.	5-1986
4,076,617	Bybel et al.	2-1978
4,923,843	Saforo et al.	5-1990
4,081,365	White et al.	3-1978
5,372,723	de Geus et al.	12-1994
2001/0022290	Shiota et al.	9-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 28, 31, 33, 34, 38, 40, 44-49, 59, 64-68, and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,137,162 to Mohri et al. ("Mohri") in view of U.S. Patent No. 5,407,644 to Rytter et al. ("Rytter"), Cote, U.S. Patent No. 4,589,927 to Allen et al. ("Allen") and Bybel.

As to claim 65, Mohri teaches a method of treating an aqueous influent containing organic matter **(Mohri title and abstract)**, the method comprising:

injecting an oxidizing gas into a bottom portion of a vertical oriented column reactor **(Mohri col. 5 lines 52-54)**;

suspending a bed of catalyst material in the column reactor to form a fluidized bed of catalyst material in the reactor wherein at least a portion of the fluidized bed is disposed in the lower portion of the column reactor **(Mohri col. 2 lines 50-55, and col. 5 lines 24-30)**;

wherein the oxidizing gas injected into the column reactor functions to suspend the bed of catalyst material in the reactor **(Mohri col. 2 lines 10-20)** ;

injecting the influent to be treated into the bottom portion of the column reactor where the influent is contacted with the oxidizing gas in the presence of the fluidized bed of catalyst material **(Mohri col. 5 lines 20-25)**;

directing the treated influent from the reactor **(Mohri col. 5 lines 35-40)**;

retaining at least a second portion of the treated water such that the second portion of the treated water is non-permeated water and drawing off at least a portion of the non-permeated treated water from the upper portion of the column reactor, and providing water containing regenerated catalyst into the lower portion of the column reactor **(Mohri col. 8 and 9 and col. 5 lines 35-51; activated carbon particles will be drawn off with the water, regenerated and reused).**

Mohri is different from claim 65 in that an immersed membrane filtration unit disposed in the upper portion of the column reactor which filters a portion of the treated water, after it was directing through the fluidized bed of catalyst material and oxidizing gas in the lower portion of the column reactor is not shown; Mohri also does not explicitly recite that the water bearing activated carbon which is drawn off on top is reused in a recirculating regeneration line; and Mohri does not contemplate the collection and recirculation of the oxidizing gas.

As to the use of a filter membrane being used to filter treated water from the catalyst, Rytter teaches the use of a fludized bed reactor in which gaseous reactants are bubbled through a slurry containing a catalytic material **(Rytter see in the Figures and abstract)**. Rytter explains that the filter facilitates the separation the products in the slurry from the catalyst, which catalyst is left behind for further reactions **(Rytter**

abstract and col. 4 lines 50-63; and col. 3 lines 15-20). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to provide a liquid product filter in the bed reactor of Mohri in order to ensure that the catalyst material is retained in the reactor and is not drawn off the with products stream. With respect to type of filter element used, Rytter teaches the use of several different common filter elements **(Rytter col. 3 lines 8-10)**, but a membrane filter is not specifically mentioned. However, the purpose of filter is to filter off the products and to leave behind the catalyst **(See Rytter abstract)**, so a person of ordinary skill in the art would have known to choose a filter suited to filtering finely divided activated carbon catalyst -- Cote provides membrane filters in a reactor in order to separate treated liquid from liquid in the reactor which contains activated carbon **(Cote col. 7 lines 1-5, and col. 8 lines 55-60)**. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to choose a membrane filter element in the device of Mohri and Rytter in order to retain finely divided activated carbon catalyst. As to the location of the filter within the reactor, Rytter depicts the filter about the middle of the reactor, but a person of ordinary skill in the art at the time of invention would know to place the filter in the upper portion of the reactor, where the reactants, i.e. contaminated water, would have had ample opportunity to contact the catalyst and the oxidizing gas. Therefore, it would have been obvious to place the filter in the upper portion of the reactor.

As to the use of a liquid recirculation line, Allen teaches the use of a recirculation line in a fluidized bed reactor which allows for draws slurry from the top of the reactor

and reintroduces it into the bottom of the reactor **(Allen see 20 in the Figure)**. Allen explains that the use of the recirculation line increases reactor efficiency by allowing the reactor to run at high flow velocities by allowing multiple passes for reactions to occur **(See Allen col. 3 lines 10-20)**. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to provide a recirculation line in the reactor of Mohri, Rytter and Cote in order to allow for multiple passes of slurry through the reactor, thereby allowing for a more complete reaction at high flow volumes.

As to the recirculation of oxidizing gas, Bybel teaches the recovery and reuse of ozone in a water treatment system **(Bybel See Fig. 1, and col. 3 lines 15-25)**. It would have been obvious to a person of ordinary skill in the art at the time of invention to reuse the unreacted ozone gas in order to conserve power needed to produce ozone.

As to claims 28 and 33, the catalyst material is activated carbon **(See Mohri abstract)**.

As to claim 31, Mohri, Rytter, Cote, Allen, and Bybel teach the method of claim 65 and Mohri teaches that the activated carbon granules are

As to claim 34, Mohri, Rytter, Cote, Allen, and Bybel teach the method of claim 65, and the membrane filters of Cote are microfiltration modules **(Cote see col. 12 lines 35-40)**.

As to claim 38, Mohri, Rytter, Cote, Allen, and Bybel teach the method of claim 65, Cote teaches that the membrane filtration units are ozone-resistant organic membranes like PVDF or PTFE **(col. 4 lines 50-55)**.

As to claim 40, Mohri, Rytter, Cote, Allen, and Bybel teach the method of claim 65, and Mohri teaches that the oxidizing gas used is ozone **(Mohri col. 5 lines 50-55)**.

As to claim 44, Mohri, Rytter, Cote, Allen, and Bybel teach the method of claim 65, and the use of mechanical stirring is not required.

As to claims 45 and 46, Mohri, Rytter, Cote, Allen, and Bybel teach the method of claim 65, but is silent as to the length of time the effluent is reacted in the ozone reaction chamber. It is within the understanding of a person of ordinary skill in the art that contact time with a catalyst is a result effective variable, based on the reactivity of the catalyst and the concentration of the constituents to be reacted. The residence time for the water to be treated may be adjusted either by controlling the flow rate through the reactor and the reactor length **(See col. 2 lines 20-34).** Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to optimize the dwell time of the effluent with that catalyst in Mohri, Rytter, Cote, Allen, and Bybel in order to fully oxidize all of the contaminants.

As to claims 47, Mohri, Rytter, Cote, Allen, and Bybel teach the method of claim 65, and Rytter teaches using a suction source for providing a pressure differential across the filter **(See 42 in Fig. 2)**. Rytter explains that the fluctuations in flow across the filter result in an anticlogging effect **(col. 5 lines 5-10)**. Therefor it would have been obvious to person of ordinary skill in the art at the time of invention to provide a suction source on the downstream side of the filter in order to produce fluctuations in the flow across the filter, which has an anticlogging effect. Also, it is within the skill and knowledge of a person of ordinary skill in the art to place the suction source outside the

reactor, for example on the drain tube **(See Rytter 25 and 24)**, in order to facilitate access the components in case they need to be monitored, repaired, or replaced.

As to claims 48 and 49, Mohri, Rytter, Cote, Allen, and Bybel teach the method of claim 47, but a suction pressure is not explicitly mentioned in the Rytter reference. However, the pressure of the pump is related to the pressure differential across the filter, which in turn controls the anti-clogging effect. Therefore, the pressure is a result effective variable which controls the anti-clogging effect. *Discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill in the art and would have been obvious, consult In re Boesch and Slaney (205 USPQ 215 (CCPA 1980)).*

As to claim 66, Mohri, Rytter, Cote, Allen, and Bybel teach the method of claim 65, and because the catalyst material is located inside the reactor along with an immersed membrane filter, some of the catalyst will inherently be located on the surface of the membrane through which liquid passes.

As to claim 67, Mohri, Rytter, Cote, Allen, and Bybel teach the method of claim 65, and Cote shows the use of a series of membranes **(See Cote in the Figures)**. With respect to the function of the oxidizing gas, Mohri combines the gas with the inflent in order to fluidize the bed of catalytic material **(See abstract)**, and that the gas is an oxidant source **(See Mohri col. 5 lines 50-55)**. Rytter uses a gas in conjunction with a catalyst containing slurry and a filter, and the gas provides for controlling clogging on the filter, as the gas **(See Rytter col. 5 lines 1-10)**.

As to claim 68, Mohri, Rytter, Cote, Allen, and Bybel teach the method of claim 65, and the incorporation of Rytter to Morhi would produce a single chamber column reactor as Mohri has only a single column, and Rytter is meant to place the filter module directly in the reaction portion of the column **(See Mohri and Rytter in the Figs.)**.

As to claim 70, Mohri teaches a system for treating an aqueous influent containing organic matter **(Mohri title and abstract)**, the system comprising:

a single chamber column reactor oriented in a vertical configuration and having a bottom portion and an upper portion **(Mohri 1)**;

an influent inlet formed in the bottom portion of the column reactor for permitting the influent to enter the bottom portion of the column reactor **(Mohri 4)**;

a fluid bed of catalyst material disposed in the column reactor where in a substantial portion of the fluid bed of catalyst material is disposed in the lower portion of the column reactor **(Mohri see in the Figure and col. 5 lines 25-30, L_2 shows the relative height of the fluidized bed of activated carbon)**;

an oxidizing gas inlet formed in the bottom portion of the column reactor for injecting an oxidizing gas into the bottom portion of the column reactor **(Mohri 10)**;

Mohri is different from claim 70 in that an immersed membrane filtration unit disposed in the upper portion of the column reactor; Mohri also does not explicitly recite a water recirculation line; and Mohri does not contemplate the collection and recirculation of the oxidizing gas.

As to the use of a filter membrane being used to filter treated water from the catalyst, Rytter teaches the use of a fludized bed reactor in which gaseous reactants are bubbled through a slurry containing a catalytic material **(Rytter see in the Figures and abstract)**. Rytter explains that the filter facilitates the separation the products in the slurry from the catalyst, which catalyst is left behind for further reactions **(Rytter abstract and col. 4 lines 50-63; and col. 3 lines 15-20)**. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to provide a liquid product filter in the bed reactor of Mohri in order to ensure that the catalyst material is retained in the reactor and is not drawn off the with products stream. With respect to type of filter element used, Rytter teaches the use of several different common filter elements **(Rytter col. 3 lines 8-10)**, but a membrane filter is not specifically mentioned. However, the purpose of filter is to filter off the products and to leave behind the catalyst **(See Rytter abstract)**, so a person of ordinary skill in the art would have known to choose a filter suited to filtering finely divided activated carbon catalyst -- Cote provides membrane filters in a reactor in order to separate treated liquid from liquid in the reactor which contains activated carbon **(Cote col. 7 lines 1-5, and col. 8 lines 55-60)**. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to choose a membrane filter element in the device of Mohri and Rytter in order to retain finely divided activated carbon catalyst. As to the location of the filter within the reactor, Rytter depicts the filter about the middle of the reactor, but a person of ordinary skill in the art at the time of invention would know to place the filter in the upper portion of the reactor, where the reactants, i.e. the

contaminated water in Mohri, would have had ample opportunity to contact the catalyst and the oxidizing gas. Therefore, it would have been obvious to place the filter in the upper portion of the reactor.

As to the use of a liquid recirculation line, Allen teaches the use of a recirculation line in a fluidized bed reactor which allows for draws slurry from the top of the reactor and reintroduces it into the bottom of the reactor **(Allen see 20 in the Figure)**. Allen explains that the use of the recirculation line increases reactor efficiency by allowing the reactor to run at high flow velocities by allowing multiple passes for reactions to occur **(See Allen col. 3 lines 10-20)**. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to provide a recirculation line in the reactor of Mohri, Rytter and Cote in order to allow for multiple passes of slurry through the reactor, thereby allowing for a more complete reaction at high flow volumes.

As to the recirculation of oxidizing gas, Bybel teaches the recovery and reuse of ozone in a water treatment system **(Bybel See Fig. 1, and col. 3 lines 15-25)**. It would have been obvious to a person of ordinary skill in the art at the time of invention to reuse the unreacted ozone gas in order to conserve power needed to produce ozone.

As to claim 59, Mohri, Rytter, Cote, Allen, and Bybel teach the system of claim 70, and the amount of catalyst is known to those skilled in the art to determine the number of reactive sides provides to reactants. Therefore, it would have been obvious to control the concentration of activated carbon catalyst in the system of Mohri, Rytter, Cote, Allen, and Bybel in order to provide adequate catalytic sites. *Discovery of an optimum value of a result effective variable in a known process is ordinarily within the*

skill in the art and would have been obvious, consult In re Boesch and Slaney (205 USPQ 215 (CCPA 1980)).

As to claim 64, Mohri, Rytter, Cote, Allen, and Bybel teach the system of claim 70, and Cote teaches the use of a 0.25 micron pore size in the filtration module **(See Cote col. 12 lines 35-40)**. Applicant explains that microfiltration units are within the scope of the claims **(See instant specification page 13 lines 4-7)**. Moreover, the subjective reason why a given membrane is selected is functional, and does not serve to define the invention in terms of its structure. See also MPEP 2114.

Claims 28, 29, 32, 55, 57,60- 63, 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mohri, Rytter, Cote, Allen, and Bybel as applied to claims 65 and 28 in further view of U.S. Patent No. 4,923,843 to Saforo et al. ("Saforo").

As to claims 28 and 55, Rytter, Cote, Allen, and Bybel teaches the method of claims 65 and 70, but uses activated carbon, which in the opinion of the examiner constitutes a mineral material, but it is not explicitly contemplated as mineral material. Safaro teaches combining activated carbon with alumina in order to produce a more absorbent material which has a greater capability of absorbing non-polar organics and polar impurities **(See Sarafo col. 1 lines 20-45 and col. 3 lines 15-20)**. Therefore, it would have been obvious to a person of ordinary skill in the art to combine alumina with the activated carbon in order to produce a more effective sorbent for differing types of impurities.

As to claim 29, Mohri, Rytter, Cote, Allen, Bybel and Safaro teaches the method of claim 28, and Safaro teaches using dopants, such as zeolites, which are known to contain metals, in order to change the properties of the catalyst **(Safaro col. 5 lines 49-54)**. Therefore, it would have been obvious to a person of ordinary skill in the art to add dopants in order to adjust the properties of the catalyst.

As to claims and 32, 62, and 63, Mohri, Rytter, Cote, Allen, Bybel teaches the method of claims 31 and 70, but only suggest 100μm as the lower limit for the particle size. Safaro teaches a catalyst with a varying sizes and particle sizes **(Safaro col. 8 lines 25-40)**. It is within the understanding of a person of ordinary skill in the art to use a fine mesh size in order to maximize the surface area of the catalyst material, however, Mohri, Rytter, Cote, Allen, and Bybel confines the treatment material to the treatment chamber, so the particle size must be larger than the pore size of the membrane filter in Cote. It is within the skill of a person of ordinary skill in the art to optimize the mesh size of the catalyst in order to maximize the reactive surface area and to ensure it is not transported through the filter. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to provide catalyst particles in the size of 10μm -- 40μm in order to maximize the reactive surface area and to confine the particles to the treatment chamber.

As to claims 69 and 60, Mohri, Rytter, Cote, Allen, and Bybel teach the method of claim 67 and 70, but do not suggest using bohmite alumina in the catalyst material. Safaro teaches combining activated carbon with boehmite alumina in order to produce a more absorbent material which has a greater capability of absorbing non-polar organics

and polar impurities **(See Sarafo col. 1 lines 20-45, col. 3 lines 15-20, and col. 6 lines 25-30)**. Therefore, it would have been obvious to a person of ordinary skill in the art to combine boehmite alumina with the activated carbon in order to produce a more effective sorbent for differing types of impurities.

As to claim 57, Mohri, Rytter, Cote, Allen, Bybel, and Safaro teach the method of claim 55, and Mohri teaches using catalyst particles of 100μm and Safaro contemplates using particles of in the micron and submicron range **(See Mohri col. 3 lines 60-68; and see Safaro col. 8 lines 25-40)**.

As to claim 61, Mohri, Rytter, Cote, Allen, Bybel, and Safaro teach the system of claim 60, and Safaro teaches using dopants, such as zeolites, which are known to contain metals, in order to change the properties of the catalyst **(Safaro col. 5 lines 49-54)**. Therefore, it would have been obvious to a person of ordinary skill in the art to add dopants in order to adjust the properties of the catalyst.

Claims 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mohri, Rytter, Cote, Allen, and Bybel as applied to claim 65 above and in further view of U.S. Patent No. 5,372,723 to de Geus et al. ("de Geus").

As to claims 35 and 36, Mohri, Rytter, Cote, Allen, and Bybel teaches the method of claim 65, but teaches that the filtration membranes are microfiltration membranes. Nanofiltration and ultrafilitration, as well as reverse osmosis, are substitutional equivalents in the field of water filtration when minute particles are to be removed **(de Geus abstract)**. Therefore, it would have been obvious to a person of ordinary skill in

the art at the time of invention to substitute the microfiltration membrane of Cote with either a nanofiltration or ultrafiltration membrane in order to remove particulates of a particular minute size. See also MPEP 2144.06 (II).

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mohri, Rytter, Cote, Allen, and Bybel as applied to claim 65 above and in further view of U.S. Patent No. 4,081,365 to White et al. ("White").

As to claim 37, Mohri, Rytter, Cote, Allen, and Bybel teache the method of claim 65 but does not teach the use of a mineral filtration unit. White teaches the use of a mineral filtration unit in association with an activated carbon bed **(White col. 3 lines 1-10)**. It is within the understanding of a person of ordinary skill in the art, and conventional to use a mineral filtration unit to adjust the mineral content of an effluent and to remove certain inorganic material. Therefore it would have been obvious to a person or ordinary skill in the art at the time of invention to further provide a mineral filtration unit in the device used in the method of Cote in order to adjust the mineral content and remove inorganic material.

Claims 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mohri, Rytter, Cote, Allen, and Bybel as applied to claim 65 above and in further view of U.S. Patent Application Publication No. 2001/0022290 to Shiota et al. ("Shiota").

As to claim 41, over Mohri, Rytter, Cote, Allen, and Bybel teach the method of claim 65 but does not teach introducing H_2O_2 into the reactor. Shiota teaches using

peroxide as an activated carbon catalyst oxidation treatment in order to increase the carbon catalytic activity in the presence of inorganic contaminants **(Shiota [0060] and [0063])**. Therefore it would have been obvious to a person of ordinary skill in the art at the time of invention to further add peroxide to the reactor in Cote in order to increase the catalytic activity of the activated carbon in the presence of inorganic contaminants.

(10) Response to Argument

Applicant first argues on page 7 that it would not have been obvious to place an immersed membrane filter in the Mohri reactor. Applicant's argument is based on the applicant's interpretation that Mohri provides for sufficient retention of the carbon particles under the normal operating conditions of Mohri. See Appeal Brief pages 7-9. Applicant cites to several portions of Mohri in which the operational parameters are discussed. In response, applicant appears to be overlooking the teachings of Mohri as a whole; namely that Morhi contemplates situations in which *the activated carbon will fly out of the reactor* (See e.g. Mohri col. 4 lines 25-30; and see col. 4 lines 45-52). The examiner respectfully points out with respect to Mohri, that patents are relevant prior art for all that they teach; the use of a reference is not limited to what the patentee described as their invention. See MPEP 2123. A person having ordinary skill in the art having Morhi would have found the addition of the outlet filter obvious, as taught by Rytter, in order to ensure separation of the catalyst (activated carbon) from the treated fluid that is exiting the reactor, so that the activated carbon does not fly out under any circumstances.

Applicant next argues on pages 10, that it is improper to further modify the Rytter filter to include a membrane filter. Applicant cites to specific teachings in Rytter which describe the filter pore size of Rytter and alleges that this is sufficient to trap the activated carbon particles in Mohri. In response, Rytter provides a teaching on how a person having ordinary skill should select a filter (See col. 3 lines 7-15); Rytter also gives examples of filters in an open-ended "comprising" group; but does not mention that any filter media in particular is critical to the Rytter filter member. Rytter also does not specify that the catalyst used is activated carbon. Cote is relied upon to show that a person having ordinary skill would have found it obvious in selecting a membrane filter for the filter in Morhi as modified by Rytter, as Cote contemplates teaches using a membrane in order to separate permeate liquid from liquid in a reactor, which contains activated carbon. The examiner also respectfully points out that "[a] person of ordinary skill in the art is also a person of ordinary creativity, not an automaton." KSR v. Teleflex, 82 USPQ2d at 1397. That is to say, a person having ordinary skill would have looked to Mohri and Rytter and taken from Rytter that the filter contemplated is selectable. Cote suggests the specific use of a membrane filter to thereby filter out permeate liquid from a reactor when the reactor contains activated carobon particles, and the use of a membrane filter to filter out activated carbon particles produces no more than the predictable, ordinary results of retaining the activated carbon within the reactor.

Applicant next argues on page 11 that it is improper to find that movement of the filter from the middle of the reactor to the top of the reactor is obvious. In response, a person having ordinary skill in the art would have found movement of the filter to the top

portion of the reactor obvious in order to allow ample contact time for the reactants. The outlet of the reactor in Mohri is also at the top of the reactor -- so a person having ordinary skill in the art would find this a natural place to locate a filter.

Applicant argues on pages 11 and 12 that the examiner has erred in combining Allen with Mohri, Rytter, and Cote. Applicant's argument is based on the presumption that Mohri already allegedly produces "extraordinary results." In response, Allen teaches that the use of a recirculation line increases reactor efficiency by allowing the reactor to run at higher flow velocities by allowing multiple passes of slurry through the reactor for reactions to occur. Applicant's allegation is essentially an argument that the reactor in Mohri is already optimized, but this is not considered evidence, as it is merely an unsupported attorney argument. See MPEP 2145(I), *attorney argument is not evidence where evidence is necessary.* Also, as applicant points out in Mohri, the contaminants are not completely consumed. See Appeal Brief page 12. Therefore, there is still room for improvement in the Mohri reactor, for at least the reason that the contaminants have not been completely exhausted in Mohri.

Lastly, applicant argues on page 13 that the combination of Mohri, Rytter, Cote, and Allen with Bybel is improper. Applicant argues that in order to make a combination between Bybel with Mohri, Rytter, Cote, and Allen, that a finding must first be made that there is "significant unreacted ozone in the Mohri reactor." In response to applicant's argument that there is no teaching, suggestion, or motivation to combine the references, the examiner recognizes that obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention

where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007). In this case, both Bybel and Mohri are reactors in which ozone is bubbled through the reactor to treat the liquid in the reactor. Bybel contemplates an ozone recirculation line which captures and recirculates the ozone and oxygen gas. Bybel does not appear to require that the ozone recirculation system only works when there is significant ozone. In fact Bybel contemplates that the gas recirculated is the "residual ozone and oxygen." (See Bybel col. 3 lines 19-21). Therefore, a person of ordinary skill in view of Mohri and Bybel, would expect the inclusion of an ozone recirculation linen Mohri, as is taught in Bybel, would simply recirculated any unreacted ozone along with oxygen gas, for further use in treatment.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Lucas Stelling/

Examiner, Art Unit 1776

/Duane Smith/

Supervisory Patent Examiner, Art Unit 1776

Conferees:

Duane Smith /DS/

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